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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/584,269	04/10/2007	Haoyi Wan	292986US8PCT	5615

22850 7590 07/08/2009
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EXAMINER

NICKERSON, JEFFREY L

ART UNIT	PAPER NUMBER
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2442

NOTIFICATION DATE	DELIVERY MODE
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07/08/2009

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/584,269	Applicant(s) WAN ET AL.	
	Examiner JEFFREY NICKERSON	Art Unit 2442	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 March 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>08 May 2009, 05 June 2009</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This communication is in response to Application No. 10/584,269 filed nationally on 10 April 2007 and internationally on 24 December 2004. The amendment presented on 16 March 2009, which provides change to claims 1-3 and 5-6, and adds claims 7-8, is hereby acknowledged. Claims 1-8 have been examined.

Response to Arguments

2. Applicant's arguments filed 16 March 2009 with respect to the rejection(s) of claim(s) 1-8 under 35 USC 103 in view of various references cited have been fully considered and are persuasive. Therefore, the rejection(s) have been withdrawn. However, new rejection may appear below.

Independent claims 1 and 6

Applicant argues the combined teachings of Liu et al ("AOTO...") and Chatterjee et al ("A weight based...") fail to render obvious several limitations within these claims. Specifically, applicant argues the combined teachings fail to render obvious the following:

"wherein when calculating the first total metric value, the total metric value calculator calculates a first weighted metric value by calculating a product of a metric value of a route to the first existing node and a first weighting coefficient indicative of a number of adjacent nodes to the first existing node, the total metric value calculator also calculates a second weighted metric value by calculating a

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product of a metric value of a route to the second existing node via the first existing node and a second weighting coefficient indicative of a number of adjacent nodes to the second existing node, and the first total metric value is calculated as a sum of the first weighted metric value and the second weighted metric value, and

when calculating the second total metric value, the total metric value calculator calculates a third weighted metric value by calculating a product of a metric value of a route to the second existing node and the second weighting coefficient, the total metric value calculator also calculates a fourth weighted”.

Applicant's arguments are persuasive and, therefore, the rejections of these claims are hereby withdrawn.

Dependent claims 2-7 and 8

Applicant argues these claims conditionally based on the arguments presented for their parent claim(s).

Applicant's arguments are persuasive and, therefore, the rejections of these claims are hereby withdrawn.

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
4. Claims 1-4 and 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu et al ("AOTO: Adaptive Overlay Topology Optimization in Unstructured P2p Systems", 04 December 2003), and in further view of Li et al ("Efficient Distribution Path Selection for Shared Restoration Connections", 2002) and Chatterjee et al ("A Weight Based Distributed Clustering Algorithm for Mobile ad hoc Networks", 2000).

Regarding claim 1, Liu teaches a node device which newly joins a network formed by a first existing node and a second existing node (Liu: pg 4187, Figure 2), the node device comprising:

a virtual connection establisher unit configured to establish a first virtual connection with the first existing node and configured to establish a second virtual connection with the second existing node (Liu: pg 4186, section I, paragraphs 3-4 provides a newly connecting node goes out and identifies which nodes are its neighbors);

a total metric value calculator unit configured to calculate a first total metric value corresponding for the first virtual connection and configured to calculate a second total metric value for the second connection (Liu: pgs 4187, section II, subsection A provides for summing costs along a virtual connection; subsection B all paragraphs specify that a

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new node identifies its neighbors and builds a cost table for logical neighbors and provides for determining total costs by exchanging cost tables with neighbors); and

a connection establisher unit configured to establish a connection with the first existing node when the first total metric value is smaller than the second total metric value, and configured to establish a connection with the second existing node when the second total metric value is smaller than the first total metric value (Liu: pg 4187-4188, section II, subsection B, paragraph 3 specifies the node only floods a message to the nodes with least cost, i.e. not non-flooding neighbors); and

wherein when calculating the first total metric value:

the total metric value calculator calculates a first weighted metric value based on the metric value of a route to the first existing node (Liu: pg 4187, Section 2, subsection A provides for summing costs along a path; See also Figure 2);

and also calculates a second weighted metric value based on a metric value of the route to the second existing node via the first existing node (Liu: pg 4187, Section 2, subsection A provides for summing costs along a path; See also Figure 2);

and the first total metric value is calculated as a sum of the first weighted value and the second weighted metric value (Liu: pg 4187, Section 2, subsection A provides for summing costs along a path; See also Figure 2); and wherein when calculating the second total metric value:

the total metric value calculator calculates a third weighted metric value based on the metric value of a route to the second existing node (Liu: pg 4187, Section 2, subsection A provides for summing costs along a second path; See also Figure 2);

and also calculates a fourth weighted metric value based on a metric value of the route to the first existing node via the second existing node (Liu: pg 4187, Section 2, subsection A provides for summing costs along a second path; See also Figure 2);

and the second total metric value is calculated as a sum of the third weighted value and the fourth weighted metric value (Liu: pg 4187, Section 2, subsection A provides for summing costs along a second path; See also Figure 2); and

wherein a node characteristic is indicative of the number of adjacent nodes (Liu: pg 4188, section III, paragraph 1 specifies node degree is a common characteristics used in topology analysis; See also pg 4189, section III, subsection B, paragraph 3).

Liu does not teach wherein the respective weighted metric values are calculated by calculating a product of the respective metric value of the route with the respective weighting coefficient value; or

wherein the weighting value is based on a node characteristic.

Li, in a similar field of endeavor, teaches wherein the respective weighted metric values are calculated by calculating a product of the respective metric value of the route with the respective weighting coefficient value (Li: pg 143, RHS first paragraph provides

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for assigning a link cost by multiplying a weighting factor $W[i]$ with the cost $\min(b, M+b-R[i])$; See also pg 142-143, RHS bottom #4 for description of $W[i]$).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the teachings of Li for weighting a metric based on weighting coefficient values. The teachings of Li, when implemented in the Liu system, will allow one of ordinary skill in the art to weight link costs in the total cost determination scheme. One of ordinary skill in the art would be motivated to utilize the teachings of Li in the Liu system in order to make link costs dynamic based on a multitude of values and therefore more accurate depending on user needs.

The Liu/Li system does not teach wherein the weighting value is based on a node characteristic.

Chatterjee, in a similar field of endeavor, teaches wherein the weighting value is based on a node characteristic (Chatterjee: abstract; pg 515, section 3.2, all subsections, but specifically step 6; See also section 3.3., paragraph 3 for definition of variables).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the teachings of Chatterjee for weighting based on node characteristics. The teachings of Chatterjee, when implemented in the Liu/Li system, will allow one of ordinary skill in the art to weight link costs based on preferred node characteristics in the cost determination scheme. One of ordinary skill in the art would be motivated to utilize the teachings of Chatterjee in the Liu/Li system in order to give some node characteristics more importance than others when determining the metric.

Regarding claim 2, the Liu/Li/Chatterjee system teaches further comprising:

an acquirer unit configured to acquire, from at least one of the first existing node and the second existing node, a node-to-node connection information of an adjacent node to any other of the plurality of existing nodes forming the network (Liu: pgs 4187-4188, section II, subsection B, paragraph 1 specifies the node exchanges a neighboring cost table with each of its logical neighbors); and

wherein the weighted metric value calculator unit is configured to calculate the weighted metric value in accordance with the node-to-node connection information (Liu: pgs 4187-4188, section II, subsection B, paragraph 2 specifies exchanged neighboring cost tables are incorporated into the algorithm for building the spanning tree , i.e. its message flooding strategy).

Regarding claim 3, the Liu/Li/Chatterjee system teaches wherein the node-to-node connection information includes a node ID (node number) for identifying the adjacent node, a metric value (cost) of a route between each of the first existing node and the second existing node to the adjacent node, and a number of the nodes adjacent to the adjacent node (Liu: pgs 4187-4188, section II, subsection B, all paragraphs specifies that cost tables maintain a cost between itself and all logical peers and that these tables are exchanged between immediately adjacent neighbors; therefore the received exchanged table inherently contains an entry for every logical node adjacent to the immediate neighbor, therefore the exchanged cost table contains the number of nodes

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adjacent to the adjacent node; pg 4187, section II, subsection C, all paragraphs specify a minimizing algorithm that determines optimal flooding routes which inherently must contain some type of node identifier so that the node knows which nodes are which, and in the pseudo code Liu uses an integer node number).

Regarding claim 4, the Liu/Li/Chatterjee system teaches wherein the metric value includes at least one of a number of hops, network bandwidth, communication costs, delay, load, MTU, or reliability (Liu: pgs 4187-4188, section II, subsection B, paragraph 1 specifies network delay is used for cost).

Regarding claim 6, this method claim comprises limitations corresponding to that of claim 1 and the same rationale of rejection is used, where applicable.

Regarding claim 7, the Liu/Li/Chatterjee system teaches wherein the acquirer unit periodically acquires updated node-node connection information by broadcasting an update notification to the first existing node and the second existing node (Liu: pg 4187-4188, section II, subsection B, paragraph 2 specifies probing neighbors for cost information; subsection C, last paragraph specifies can be periodic).

Regarding claim 8, this method claim comprises limitations corresponding to that of claim 7 and the same rationale of rejection is used, where applicable.

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5. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over by Liu et al ("AOTO: Adaptive Overlay Topology Optimization in Unstructured P2p Systems", 04 December 2003), in view of Li et al ("Efficient Distribution Path Selection for Shared Restoration Connections", 2002) and Chatterjee et al ("A Weight Based Distributed Clustering Algorithm for Mobile ad hoc Networks", 2000), and in further view of Traversat et al (US 2002/0147771 A1).

Regarding claim 5, the Liu/Li/Chatterjee system teaches wherein the acquirer unit is configured to notify, the first existing and the second existing node, for the node-node connection information (Liu: pg 4187-4188, section II, subsection B, paragraph 2 specifies probing neighbors for cost information); and

wherein response information is node-node connection information (Liu: pg 4187-4188, section II, subsection B, paragraph 2 specifies probing neighbors for cost information); and

wherein requested information is a metric value (Liu: pg 4187-4188, section II, subsection B, paragraph 2).

The Liu/Li/Chatterjee system does not teach notifying a type of requested information or a combination of requested information to be included in the response information.

Traversat, in a similar field of endeavor, teaches notifying a type of requested information or a combination of requested information to be included in the response

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information (Traversat: [0350]-[0356] specifies that various peer information properties may be queried, such as uptime, credentials, etc).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the teachings of Traversat for requesting characteristics from another peer in the decentralized network. The teachings of Traversat, when implemented in the Liu/Li/Chatterjee system, will allow one of ordinary skill in the art to form greedy and dynamic cost tables by requesting information relevant to a node's own interests. One of ordinary skill in the art would be motivated to utilize the teachings of Traversat in the Liu/Li/Chatterjee system in order to provide a more wholesome cost table, incorporating more variables into a cost equation, and fleshing out its effectiveness.

Citation of Pertinent Prior Art

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a. Huang (US 2004/0264466 A1) discloses route determination based on total metrics based on connectivity/degree metrics.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to JEFFREY NICKERSON whose telephone number is (571)270-3631. The examiner can normally be reached on M-Th, 9:00am - 7:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Caldwell can be reached on (571)272-3868. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. N./
Jeffrey Nickerson
Examiner, Art Unit 2442

/Andrew Caldwell/
Supervisory Patent Examiner, Art
Unit 2442